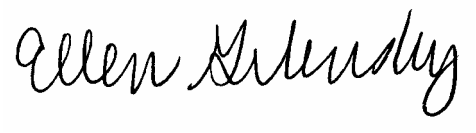
COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Division of Water Quality
Ellen Gilinsky, Ph.D.
Director

Subject: Guidance Memo No: GM04-2005, Amendment # 2
Water Quality Monitoring Consolidated Guidance Memorandum

To: Regional Directors

From: Ellen Gilinsky, Ph.D.
Director



Date: March 26, 2007

Copies: Rick Weeks, James Golden, Karen Sismour, Kyle Winter, David Davis, Jack Vanderland, Fred Cunningham, DEQ Water Quality Monitoring Central and Regional Office Staffs

Summary:

This guidance memo, originally adopted on February 2, 2004, and previously amended in November 2004, updates consolidated water quality monitoring guidance, including pre-existing water monitoring guidance by reference (Sections I, VIII), and additional guidance covering several aspects of water quality monitoring (Sections II - VII). The additional sections of guidance were developed as a result of an internal review of the ambient water quality monitoring program initiated in 2002. Because of ongoing improvements in both monitoring methodology and technology, this guidance will be scheduled for review and updates at least once every three years.

This consolidated guidance memorandum will serve as a water quality monitoring guidance manual for agency staff. This latest amendment incorporates new TMDL monitoring guidance in Section 1.11, changes to Chain of Custody Guidance documents (GM00-2016, Amendment #1 and GM03-2003, Amendment #1) adopted in March 2006 and inserted into Sections 4.1 and 4.2 of this memo, changes to Quality Assurance in Section V, updates to uses of Citizen Monitoring data in Section VII, and a revision to the Water Quality Monitoring Standard Operating Procedures, dated October 2006, found in Section VIII.

Electronic Copy:

An electronic copy of this guidance in PDF format is available for staff internally on DEQnet, and for the general public on DEQ's website at: http://www.deq.virginia.gov/water.

Contact information:

Questions about this guidance manual should be directed to Darryl Glover, Water Quality Monitoring and Assessment Manager, via e-mail at dmglover@deq.virginia.gov, or by phone at 804-698-4321. Some sections of this guidance manual have additional contacts.

Disclaimer:

This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any particular method for the analysis of data, establishment of a wasteload allocation, or establishment of a permit limit. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

WATER QUALITY MONITORING CONSOLIDATED GUIDANCE MEMORANDUM

DEQ Guidance Memo: GM04-2005

Amendment # 2

March 26, 2007

DEQ WATER MONITORING CONSOLIDATED GUIDANCE MEMORANDUM

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- National Coastal Assessment – Field Operations Manual
(http://www.epa.gov/emap/nca/html/docs/c2kfm.pdf)
- Variances to Coastal 2000 (SOPs) (185kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/coastvar.pdf)

Section 1.5 Fish Tissue and Sediment Monitoring

- Quality Assurance/Quality Control Project Plan for the Fish Tissue and Sediment Monitoring Program (August 1998) (159kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/fishsop.pdf)

Section 1.6 Freshwater Probabilistic Monitoring

- Biological Monitoring Program Quality Assurance / Quality Control Project Plan
- Sampling procedures for physical and chemical parameters follow guidelines provided in the **DEQ Water Quality Monitoring Standard Operating Procedure Manual,** Version 16: **(2,730kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)
- Macroinvertebrate Sampling Methods – "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers, Second Edition" (EPA 841-B-99-002, July 1999)
(http://www.epa.gov/owow/monitoring/rbp/)
- Habitat Analysis – "Quantifying Physical Habitat in Wadeable Streams" (EPA/620/R-99/003, July 1999)
(http://www.epa.gov/emap/html/pubs/docs/groupdocs/surfwatr/field/phyhab.pdf)

Section 1.7 Watershed and Trend Station Monitoring

- Sampling procedures for physical and chemical parameters follow guidelines provided in the **DEQ Water Quality Monitoring Standard Operating Procedure Manual,** Version 16 **(2,730kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)
- Station siting methods – specific siting methods are included in **Virginia's Water Quality Monitoring Strategy**
(http://www.deq.virginia.gov/watermonitoring/monstrat.html)

Section 1.8 Kepone Monitoring Plan 2002 (December 2001)

- Kepone Monitoring Plan 2002 (72kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/kepone.pdf)

Section 1.9 Lake and Reservoir Monitoring Program

- Targeted Lake and Reservoir Monitoring, Guidance Memo 02-2004 (53kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/lakemon.pdf)

Section 1.10 Toxic Source Assessment

- Protocol for Initiating and Coordinating Toxics Source Assessments in Accordance with the DEQ Toxics Contamination Source Assessment Policy (March 2002) (68kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/toxsourc.pdf)

Section 1.11 TMDL Monitoring

- Guidelines for TMDL Monitoring (February 2007) (110kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/tmdlmonguide.pdf)
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(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/monreduc.pdf)

Section III. CEDS – Comprehensive Environmental Data System (1,502kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmceds.pdf).

Section IV. Chain of Custody

Section 4.1 Guidance Memo No. 03-2003, Amendment # 1:
Interpretation for Water Monitoring of Guidance Memo No. 00-2016
Chain of Custody Policy and Procedures (March 2006) (96kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cocinterp.pdf)

Section 4.2 Guidance Memo No. 00-2016, Amendment # 1:
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(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cocpol.pdf)

Section 4.3 Chain of Custody and Water Sample Collection Training

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Section 7.1 Citizen Nominations for Water Quality Monitoring
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Section 7.2 DEQ Support for Citizen/Non-Agency Monitoring (1,915kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cmonman.pdf)

Section 7.3 Submittal of Data to Assessment Staff

Section 7.3.1 DEQ Quality Assurance/Quality Control Approvals of Citizen/Non-Agency Data

Section 7.4 DEQ Response to Problems Detected by Citizen/Non-Agency Monitoring Organizations

Section 7.4.1 DEQ Follow-Up Monitoring of Waters with Observed Effects

Section 7.5 Guidance Memo No. 06-2010
Guidelines for DEQ Review and Approval of Biological Monitoring QAPPs Submitted by Non-DEQ Sources (August 2006) (364kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/biomonqapp.pdf)

Section VIII. Standard Operating Procedures Manual for the Department of Environmental Quality Water Monitoring Programs (Revision No. 16, October 2006) (2,730kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)

Section I.

Existing DEQ Monitoring Guidance for Consolidation

This consolidated source list of guidance documents for DEQ's Water Quality Monitoring Program is arranged in alphabetical order by subprogram title. It must be kept in mind that many of these documents are periodically revised and/or updated. Updated guidance documents will be substituted for previous versions in this electronic document as they are drafted and approved.

In many cases, DEQ monitoring activities for specific programs directly follow guidance documents provided by other state or federal agencies, academic institutions, etc. In those cases where such guidance is available electronically, the specific documents will be made available on the DEQ Website and provided with a web link to that source. When documents are only available in hardcopy form, scanned copies will be posted on DEQnet, or the responsible DEQ staff individual will be identified and the appropriate contact information provided.

Section 1.1 Ambient Water Monitoring

Water Quality Monitoring Program Quality Assurance Project Plan (838kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmpqapp.pdf)

Section 1.2 Biological Monitoring

Macroinvertebrate sampling methods – "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers, Second Edition", EPA 841-B-99-002, July 1999. This document is available in electronic format on the EPA WebPages at: http://www.epa.gov/owow/monitoring/rbp/)

Certain procedures described in the first edition of this document, but omitted from the second, describe assessment procedures still employed by the DEQ Biological Monitoring Program.

A Stream Condition Index for Virginia Non-Coastal Streams (3,694kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/vastrmcon.pdf)

Draft Sampling Protocol and SOP (to be included later)

For copies of the current draft documents, contact Jean Gregory at DEQ Central Office:
jwgregory@deq.virginia.gov (804) 698-4113

Section 1.3 Chesapeake Bay Monitoring

"**Virginia Chesapeake Bay Tributary Water Quality Monitoring Program Standard Operating Procedures Manual For Time Period July 01, 2002 Through June 30, 2003**" (Rev. April 2003). **(525kb file)** (http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cbwqmsop.pdf)

"**Virginia Tributary Monitoring Program Quality Assurance/Quality Control Project Plan for Time Period July 01, 2002 Through June 30, 2003**" (Rev. April 2003) **(549kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cbtmqapp.pdf)

"**Work/Quality Assurance Project Plan for Chesapeake Bay Mainstem and Elizabeth River Water Quality Monitoring Program**" **(1,384kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cbmnqapp.pdf)

"**Quality Assurance/Quality Control Plan for Benthic Biological Monitoring Program of the lower Chesapeake Bay**" **(197kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cbbnqapp.pdf)

"**Work/Quality Assurance Project Plan for Monitoring Mesozooplankton and Microzooplankton in the Lower Chesapeake Bay and Tributaries**"

"**Work/Quality Assurance Project Plan for Monitoring Phytoplankton, Picoplankton and Productivity in the Lower Chesapeake Bay and Tributaries" (140kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cbphqapp.pdf)

Chesapeake Bay Ambient Toxics Monitoring – "**QAPP Documentation for Chemical and Toxicological Characterization of Tidal Areas of Virginia. July 2000.**"

Standard Operating Procedures Manual for the "Chemical and Toxicological Characterization of Tidal Freshwater Areas of Virginia"

For documents not available electronically, please contact Rick Hoffman at DEQ Central Office:
fahoffman@deq.virginia.gov (804) 698-4334

Section 1.4 Estuarine Probabilistic Monitoring (Coastal 2000)

National Coastal Assessment - Quality Assurance Project Plan 2001-2004, EPA/620/R-01/002, May 2001. (http://www.epa.gov/emap/nca/html/docs/c2k_qapp.pdf)

National Coastal Assessment - Field Operations Manual, EPA/620/R-01/003 June 2001.
(http://www.epa.gov/emap/nca/html/docs/c2kfm.pdf)

Several **Variances to Coastal 2000 SOPs** have been granted to DEQ by the Regional Quality Assurance Officer of the National Coastal Assessment Program, EPA/ORD, Gulf Ecology Division (GED), in Gulf Breeze, Florida.

These variances have been summarized, along with copies of the e-mail messages authorizing them, in the document **"Chronological Record of Coastal 2000 - National Coastal Assessment Guidance Documents." (185kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/coastvar.pdf)

Section 1.5 Fish Tissue and Sediment Monitoring

Quality Assurance / Quality Control Project Plan for the Fish Tissue and Sediment Monitoring Program (August 1998) (159kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/fishsop.pdf)

A number of associated QAPP documents, associated with activities at contracted laboratories and academic institutions, are available only in hardcopy as appendices to the original guidance document. Contact Rick Browder for details:

rqbrowder@deq.virginia.gov (804) 698-4134

Section 1.6 Freshwater Probabilistic Monitoring

"Biological Monitoring Program Quality Assurance / Quality Control Project Plan", Virginia Water Control Board, September 1992.

Sampling procedures for physical and chemical parameters follow guidelines provided in the **DEQ Water Quality Monitoring Standard Operating Procedure Manual,** Version 16: **(2,730kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)

Macroinvertebrate sampling methods – "**Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers, Second Edition**", EPA 841-B-99-002, July 1999.
(http://www.epa.gov/owow/monitoring/rbp/)

Habitat analysis – "**Quantifying Physical Habitat in Wadeable Streams**" EPA/620/R-99/003, July 1999. (http://www.epa.gov/emap/html/pubs/docs/groupdocs/surfwatr/field/phyhab.pdf)

For documents not available electronically, please contact Larry Willis at DEQ West Central Regional Office or Jean Gregory at DEQ Central Office:

ldwillis@deq.virginia.gov (540) 562-6825
jwgregory@deq.virginia.gov (804) 698-4113

Section 1.7 Watershed and Trend Station Monitoring

Sampling procedures for physical and chemical parameters follow guidelines provided in the **DEQ Water Quality Monitoring Standard Operating Procedure Manual** – Version 16, cited above: **(2,730kb file)** (http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)

Station siting methods – specific siting methods are included in **Virginia's Water Quality Monitoring Strategy** (http://www.deq.virginia.gov/watermonitoring/monstrat.html)

The draft "Strategy" document is currently under revision will be available in electronic or hardcopy from Dr. Donald H. Smith at DEQ Central Office:

dhsmith@deq.virginia.gov (804) 698-4429

Section 1.8 Kepone Monitoring Plan 2002 (December 2001)

Kepone Monitoring Plan 2002 (72kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/kepone.pdf)

Section 1.9 Lake and Reservoir Monitoring Program

Targeted Lake and Reservoir Monitoring, Guidance Memo 02-2004, DEQ. (53kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/lakemon.pdf)

Section 1.10 Toxic Source Assessment

Protocol for Initiating and Coordinating Toxics Source Assessments in Accordance with the DEQ Toxics Contamination Source Assessment Policy (March 2002) **(68kb file)**
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/toxsourc.pdf)

Section 1.11 TMDL Monitoring

Guidelines for TMDL Monitoring (February 2007) (110kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/tmdlmonguide.pdf)

Guidelines for Water Toxicity Monitoring (109kb file)
(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/tmdltoxmon.pdf)

Section 1.12 Other Special Studies (Active only) –

This information is not available on the public website but can be obtained by contacting Roger Stewart at DEQ Central Office: restewart@deq.virginia.gov (804) 698-4449

Section II.

Water Monitoring Coordination Guidance

Section 2.1 Coordination of Water Monitoring Activities

Water Monitoring Strategy

Water quality monitoring has been ongoing in the Commonwealth for decades. In 1997, the Virginia General Assembly enacted the Water Quality Monitoring, Information, and Restoration Act (WQMIRA), which provides the Virginia Department of Environmental Quality (DEQ) with a mandate to perform a minimum amount of water quality monitoring. In accordance with WQMIRA, monitoring programs are developed for the maintenance, support and restoration of surface waters with regard to the following uses: aquatic life, drinking water, recreation, fishing and shellfish consumption. Various monitoring programs are implemented to accomplish this, and other activities are undertaken in fulfillment of federal, regional or other state initiatives.

The Virginia Water Quality Monitoring Strategy, first drafted in 1999, and revised in both 2004 and 2007, provides details on all water quality monitoring initiatives implemented by DEQ. It provides a comprehensive discussion of all water quality monitoring programs, including the objectives of each program and details for implementation.

The monitoring strategy is considered a dynamic document, designed to change as the Departments priorities and resources change. Biannually by the 1st of October during even-numbered years, the Office of Water Quality Programs (OWQP) will make any editorial corrections, updates to references, or minor revision to the strategy by incorporated into guidance by reference. It is the responsibility of OWQP to coordinate with each of the contacts by program to provide annual updates in a timely manner so that the annual revision date is met.

Major revisions to the strategy will be accomplished by a work group assigned by the Director of Water Quality Programs. On a six year cycle starting on October 1, 2010, a new work group will be assigned the task of determining if any major revisions are appropriate, revising the strategy, within one year, as determined by the work group and finalizing by incorporating the updates into guidance by reference.

Programs Involved In Water Quality Monitoring And Their Priority

The Virginia Department of Environmental Quality operates more than twenty different water quality monitoring programs with the purpose of surveying the quality of the Commonwealth's water resources. Each program is categorized as either a Group 1 or a Group 2 priority and is further identified by a project code, description, and contact person, See *Table 1 Prioritization of Projects* below.

Group 1, *Limited Discretion to Reduce Activities*, are those activities that are essential to the mission of the Department and which take priority over Group 2 activities as resources are available. Group 2, *Management Discretion to Reduce Activities*, are those activities that are necessary to further characterize water quality but can be expanded or contracted due to resource levels. Water quality monitoring guidance memorandum, **Managing Water Monitoring Programs While Under Reduced**

Resources, describes the prioritization of these programs in detail and is located in Section 2.3 of this document

Regional office management may propose reductions in the implementation of Group 2 activities as dictated by resources. It is the responsibility of the Director of Water Quality Programs to make the final determination of the level of monitoring of Group 2 activities consistent with resource allocations and agency policies relating to state-wide implementation of monitoring programs. A determination by the Director will be made following the annual monitoring plan compilation by the Office of Water Quality Programs. For a more detailed explanation of the development of the annual monitoring plans refer to the guidance memorandum, **Monitoring Plan Guidance** (IN DRAFT) in Section 2.2 of this document.

Project Codes, Description, And Contact

The project code is used to identify all data collected by the agency by program such that the objective, purpose, and therefore the use of the data is clearly defined. The project codes are unique and required for all data stored in the Departments Water Quality Monitoring Comprehensive Environmental Data System, CEDSWQM. The program code is assigned to each monitoring station established in CEDS. While a given station may serve more than one program code, the dominant function of the station should be selected as the primary program code. When collecting samples the individual project code will be used to identify the purpose for which that sample event occurred. For example, a trend station may also be used to provide data in support of TMDL development. Therefore, the project codes of TR and TM would apply. In this case, the TR designation would be the determinant project code as the TMDL monitoring would be parameter specific, and of limited duration.

A detailed explanation of each of the programs can be found in the Department's **Water Quality Monitoring Strategy** (http://www.deq.virginia.gov/watermonitoring/monstrat.html)

Flow Of Information Between The Data Generators And Data Users

Regional monitoring staff are responsible for keeping Total Maximum Daily Load (TMDL) staff apprised of changes in the ambient monitoring plans for TMDL watersheds. It is the responsibility of the regional assessment staff and the regional TMDL staff in coordination with Central Office TMDL staff to specifically request regional monitoring support for Waters of Concern and Special Study TMDL projects respectively. While these requests for monitoring support must be made within the timeframe required to develop the annual monitoring plans as specified in guidance in Section 2.2 of this document, occasional unanticipated data needs will need to be addressed to support the integrity of the TMDL process.

For the Ambient Watershed Monitoring Program, the Office of Water Quality Programs will determine at the end of the monitoring year those stations that are candidates for an additional two years of monitoring. This determination will be performed in accordance with the guidance for annual monitoring plan development.

Other special studies and programs; i.e. the Chesapeake Bay Program and the Saltwater and Freshwater Probabilistic Programs, require close coordination between the Contact or Program Manager and the regional monitoring staff. It is the responsibility of the Contact to disseminate the programs specific needs in terms of station location, frequency of collection, parameters, or any special sampling, handling, transportation, etc. The information flow to the regional monitoring staff must occur in enough time for the development of the annual monitoring plans as specified in guidance.

For some grant funded activities, the timing of the award of the grant does not coincide with the timing of the development of the annual monitoring plans. In those cases it is the responsibility of the Program Manager to estimate sample run requirements (number of runs, samples and parameter types) for the regional office such that during the annual monitoring plan development accurate estimates of the workload and financial resource can be provided to the Office of Water Quality Programs during the annual monitoring plan development.

Equipment And Supplies Purchasing

In an effort to provide consistency, interoperability, interchangeability, efficiency, and purchasing power, the Department specifies standard field equipment and supplies for the majority of monitoring activities. Certain special studies may require specialized equipment to be used on a limited basis. It is the responsibility of the Department's Quality Assurance Officer to work with the various program Contacts to determine the most appropriate equipment and to work with the Lab Liaison to determine laboratory supplies.

Periodically towards the end of a fiscal year, when additional funds are made available or when grant money is available, the Office of Water Quality Programs will poll the various program Contacts to determine future equipment needs. Based on funding OWQP will determine the best use for new equipment, procure the equipment, and distribute accordingly.

Table 1 Prioritization of Projects

Group 1 - Limited Discretion to Reduce Activities		
PROJECT CODE	**DESCRIPTION**	**CONTACT**
C2	Coastal 2000 Program	Don Smith
CB	Water Quality and Habitat Monitoring (CBM)	Rick Hoffman
FI	Facility Inspections	regional office
FP	Ambient Freshwater Probabilistic	Larry Willis
HG	South River South Fork of the Shenandoah River 100 Year Mercury Study	Don Kain
IR	Incident Response	regional office
PC	Pollution Complaint Investigation/Spill containment (Prep)	regional office
QA	QA/QC	Gary Du
TM	512 20 3.0 TMDL Activities	Charles Martin
TR	Ambient Trend Program	Don Smith
Group 2 - Management Discretion to Reduce Activities		
AQ	Ambient Monitoring Programs	Roger Stewart
AT	AMBTOX 514.05.00 0100 606 71606	Mark Richards
AW	Ambient Watershed Monitoring	Don Smith
CM	Citizen Monitoring requests performed by DEQ	James Beckley
ER	100 5140600 72400 Elizabeth River Monitoring	Roger Everton
FT	Fish Tissue and Sediment Program	Alex Barron
KM	Kepone Monitoring	Alex Barron
PF	Pfiesteria Monitoring	Roger Everton
RB	Benthic Biological Monitoring	Jean Gregory
RL	Lake Monitoring	Jean Gregory
SS	Special Studies	central or regional office
TW	Waters of Concern	Roger Stewart

Section 2.2 Developing Annual Water Monitoring Plans (MONPLANS)

Summary:

This section establishes the procedure for creating the annual water monitoring plan of where samples are to be collected, the matrices sampled, the frequency and parametric coverage.

Contact information for this Section:

For more information, please contact Roger Stewart at 804-698-4449, or e-mail: restewart@deq.virginia.gov.

The development of the annual monitoring plan requires the effort and coordination of multiple offices and programs within the Virginia Department of Environmental Quality (DEQ) and the interaction with other state agencies. The annual monitoring plan is a combination of each of the seven DEQ regional offices (RO) monitoring plans, Chesapeake Bay Program plan and the Fish Tissue Program plan. The annual monitoring plan corresponds with the Commonwealth fiscal year and identifies the sampling that is to occur between 1 July and 30 June. The annual plan is dated as the year in which 30 June occurs.

The annual plans identify projected sampling efforts for the following programs:

PROJECT CODE	DESCRIPTION	CONTACT
AQ	Ambient Monitoring Programs	Roger Stewart
AT	AMBTOX 514.05.00 0100 606 71606	Mark Richards
AW	Ambient Watershed Monitoring	Don Smith
C2	Coastal 2000 Program	Don Smith
CB	Water Quality and Habitat Monitoring (CBM)	Rick Hoffman
CM	Citizen Monitoring requests performed by DEQ	James Beckley
ER	100 5140600 72400 Elizabeth River Monitoring	Roger Everton
FI	Facility Inspections	regional office
FP	Ambient Freshwater Probabilistic	Larry Willis
FT	Fish Tissue and Sediment Program	Alex Barron
HG	South River South Fork of the Shenandoah River 100 Year Mercury Study	Don Kain
IR	Incident Response	regional office
KM	Kepone Monitoring	Alex Barron
PC	Pollution Complaint Investigation/Spill containment (Prep)	regional office
PF	Pfiesteria Monitoring	Roger Everton
QA	QA/QC	Gary Du
RB	Benthic Biological Monitoring	Jean Gregory
RL	Lake Monitoring	Jean Gregory
SS	Special Studies	central or regional office
TM	512 20 3.0 TMDL Activities	Charles Martin
TR	Ambient Trend Program	Don Smith
TW	Waters of Concern	Roger Stewart

The DEQ Regional Offices are responsible for developing a plan for all applicable program areas except the Fish Tissue Program, which is the responsibility of the Water Quality Standards Program. In a separate communication for the program codes QA, PC, IR, and FI, the regions will indicate the total number of estimated stations, frequency, and parameter list.

The flow of information needed to accomplish the development of the annual plan must occur under an established timeline to meet the Department's commitment to make the plan available to the public, ensure that the plan meets the budget, and is completed in time to begin monitoring on July 1st each year.

By November 30th of each year, the Office of Water Quality Programs will provide to each of the DEQ ROs a list of watersheds with the Department of Conservation and Recreation Non-Point Source rankings, watershed areas, and station densities.

By December 31st of each year, the Office of Water Quality Programs will receive requests from citizens as specified in the terms of a public notice for DEQ monitoring. These requests will be forwarded to the appropriate RO by January 15th for consideration in the regional monitoring plan. The process for handling the requests is specified in the Citizens Guidance Section of this guidance memorandum.

By December 31st of each year, the RO assessment staff will provide to the RO monitoring staff a list by DEQ region of station ids, parameters, and frequency to be monitored for those locations that need additional data identified in the 305(b) assessment as Waters of Concern.

By December 31st of each year, the RO Total Maximum Daily Load (TMDL) staff, after coordination with central office (CO) TMDL staff, will provide to the RO monitoring staff a list by DEQ region of station ids, parameters, and frequency to be monitored for those locations that need data in support of TMDL development. These lists will be supplied to the central office via incorporation into the RO annual plans.

By December 31st of each year, the CO Chesapeake Bay Program and Fish Tissue Program staff will provide to the central office monitoring staff a list by DEQ region of station ids, parameters, and frequency to be monitored for those locations. As appropriate these lists will be supplied to the ROs for annual plan development as they are received.

By December 31st of each year, the CO Chesapeake Bay Ambient Toxicity (AMBTOX) Program staff will provide to the central office monitoring staff a list by DEQ region of station ids, parameters, and frequency to be monitored for those locations. These lists will be supplied to the ROs for annual plan development as they are received.

By December 31st of each year, the CO Water Quality Standards staff will provide to the central office monitoring staff a list by DEQ region of station locations, parameters, frequencies, and fact sheets where monitoring is to occur related to Exceptional Waters. As appropriate these lists will be supplied to the ROs for annual plan development as they are received.

By December 31st of each year, the RO water permit managers will provide to the regional water monitoring managers a list of all station ids, parameters, and frequencies, for which data will be needed for Virginia Pollutant Discharge and Elimination System (VPDES) permit purposes, whether for background monitoring, below pipe monitoring, or facility inspections (FI) see GUIDANCE MEMORANDUM 01-2011 Monitoring Toxic Trace Metals in Surface Waters.

By January 15th of each year, the CO monitoring staff will develop a list of monitoring parameters for each monitoring module (e.g. trend, probabilistic, watershed, etc.). This list will be prepared in accordance with the agency monitoring strategy and will reflect conditions that may impact the targeted analytical parameters, including the state budget and specific water quality monitoring objectives for each program. This list of monitoring parameters will be distributed to the regional water quality monitoring managers for inclusion in the monitoring plan.

By February 28th of each year, ROs will complete field reconnaissance for all new station locations following the above schedule.

By April 1st of each year, the ROs will have included all proposed sampling runs in the yearly run schedule of Water Quality Monitoring Comprehensive Environmental Data System (CEDSWQM). For some grant funded activities, the timing of the award of the grant does not coincide with the timing of the development of the annual monitoring plans. In those cases, it is the responsibility of the program manager to estimate sample run requirements (number of runs, samples and parameter types) for the RO so that accurate estimates of the workload and financial resource can be provided to the Office of Water Quality Programs during the annual monitoring plan development. It is the responsibility of the ROs to ensure that the station siting, parametric matrix, and frequency are consistent with the monitoring strategy and applicable guidance.

By May 1st of each year, the Office of Water Quality Programs will have compiled all data from the yearly run schedule, added frequencies, and calculated budget projections. Consistency with the parametric matrix, station siting, and frequency by program will be included as a review of the individual monitoring plans submitted by the various groups and is the responsibility of the program Contact person listed above.

By May 1st of each year, the Office of Water Quality Programs will transmit the plan to Director of Water Quality Programs for a determination, by the 15th of May, in the adjustment of projects based on monetary resource limitations in the analytical laboratory budget.

By May 15th of each year, the Office of Water Quality Programs will return the adjusted plans to the various program contacts and ROs.

By May 31st of each year, the ROs will provide comments and or concurrence with the adjusted plan.

By June 1st of each year, the Office of Water Quality Programs will transmit the plan to DCLS.

By June 15th of each year, the Office of Water Quality Programs will finalize the plan.

By July 15th of each year, the Office of Water Quality Programs will provide the ROs with a list of carryover watershed stations; these stations will require enough additional monitoring to reach the target number of twelve data points per each of the following parameters: temperature, pH, dissolved oxygen, or bacteria. The ROs will conduct follow up monitoring to begin no later than the next monitoring year.

By July 30th of each year, the Office of Water Quality Programs will post the plan to DEQ's website.

The monitoring plans will be developed in the yearly run schedule application of CEDSWQM for all programs except the fish tissue program, which uses a separate module of CEDSWQM and is not driven by the use of yearly runs. The fish tissue program will supply their plans in a format consistent with the format of the recompiled plans queried from the yearly runs schedule.

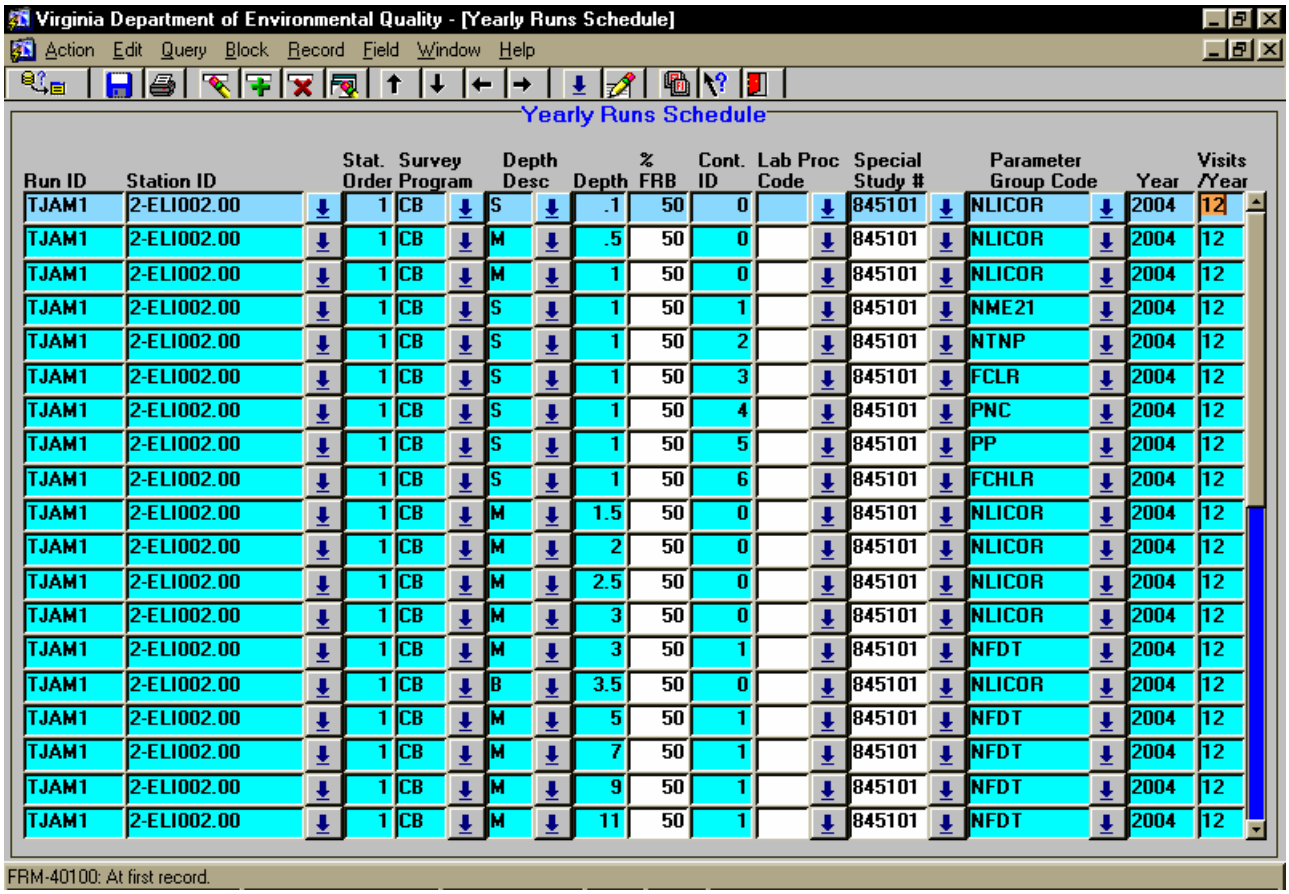
The procedure for establishing yearly runs in CEDSWQM can be found in the application documentation. The format for identifying yearly runs will be as follows.

The RUN ID will begin with the corresponding RO identifier.

N	NVRO
P	PRO
SC	SCRO
S	SWRO
T	TRO
V	VRO
W	WCRO

The next letters may be used by the RO to identify specific runs. All other information is to be completed in the YEARLY RUN SCHEDULE as is currently practiced, with the exception that the survey program codes must correspond to the program codes listed above. Additionally, you will need to complete the newly added YEAR column with 2004 and the VISITS/YEAR column with the

frequency of visits per year. For example, AW stations get 6 visits corresponding to bimonthly sampling during the 2004 monitoring year. The following is a screen print of the new form.



Run ID	Station ID	Stat. Order	Survey Program	Depth Desc	Depth	% FRB	Cont. ID	Lab Proc Code	Special Study #	Parameter Group Code	Year	Visits /Year
TJAM1	2-ELI002.00	1	CB	S	.1	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	.5	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	1	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	1		845101	NME21	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	2		845101	NTNP	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	3		845101	FCLR	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	4		845101	PNC	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	5		845101	PP	2004	12
TJAM1	2-ELI002.00	1	CB	S	1	50	6		845101	FCHLR	2004	12
TJAM1	2-ELI002.00	1	CB	M	1.5	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	2	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	2.5	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	3	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	3	50	1		845101	NFDT	2004	12
TJAM1	2-ELI002.00	1	CB	B	3.5	50	0		845101	NLICOR	2004	12
TJAM1	2-ELI002.00	1	CB	M	5	50	1		845101	NFDT	2004	12
TJAM1	2-ELI002.00	1	CB	M	7	50	1		845101	NFDT	2004	12
TJAM1	2-ELI002.00	1	CB	M	9	50	1		845101	NFDT	2004	12
TJAM1	2-ELI002.00	1	CB	M	11	50	1		845101	NFDT	2004	12

Section 2.3 Guidance Memo No. 03-2004: Managing Water Monitoring Programs While Under Reduced Resources

Summary:

This section aids in implementing Virginia's Water Quality Monitoring Strategy during periods of reduced resources.

To aid in implementing Virginia's Water Quality Monitoring Strategy during periods of reduced resources [in terms of both FTEs and non-personal services], DEQ monitoring activities are divided into the following two groups:

- Group 1 - Limited Discretion to Reduce Activities
  The agency recognizes there is little management discretion to reduce resources dedicated to these monitoring activities due to the need to: 1. minimize environmental damage from pollution incidents; 2. provide key agency programs with needed data in a timely fashion; 3. meet commitments made by the Commonwealth; and/or, 4. ensure consistency and usefulness for statewide application of data. Every effort should be taken to fully implement the monitoring plans for these activities, including reduction in monitoring resources for activities listed in Group 2. Activities are listed in priority order.

- Group 2 - Management Discretion to Reduce Activities
  These monitoring activities are considered important in providing a broad-based, comprehensive monitoring program for the Commonwealth. The goal is to conduct as much monitoring in these areas as resources allow to achieve the objectives in the Monitoring Strategy. However, management discretion exists to reduce resources dedicated to these activities based on budget constraints, either at the statewide or regional level. Any reduction in resources should be designed to maintain a balanced investment in each of these monitoring activities. No monitoring component should be entirely eliminated in any year without consultation among CO and RO staff. Activities not listed in priority order.

Group 1	Comments
Incident Response & Pollution Complaint	Investigation of pollution incidents is a top priority to minimize damage to environment.
TMDL monitoring	Commonwealth is committed to developing TMDLs in accordance with a federal court Consent Decree schedule. Supporting monitoring data is critical to completion of these TMDL special studies. Once a TMDL has been completed, monitoring can temporarily discontinue until the DEQ TMDL staff determines that implementation measures to address the source(s) of impairments are being installed. Monitoring can resume at the start of the following fiscal year, next scheduled monitoring station rotation, or where deemed necessary by the regional office or TMDL staff, as a new special study.
Chesapeake Bay Water monitoring	Commonwealth has committed to conducting monitoring of its portion of the Bay and its tributaries consistent with other Bay states.
Probabilistic monitoring	All regions need to complete their assigned probabilistic stations in order for DEQ to make defensible conclusions about water quality from a statewide perspective. The expanded habitat assessment methods for biological monitoring should be employed at the probabilistic sites.
Trend Stations	Trend analysis suffers from an interrupted data set.
Grant Funded monitoring or Other Non-General Funds	Seek grant funds based on adequate manpower and resources for match requirements. Implementation is required to meet agency grant commitments. Use non-general funds as needed and available and meet requirements for their use.

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Ambient Rotating Watershed Monitoring	Expands the geographic coverage of the ambient monitoring program - Contingent on the availability of adequate funding.	Parameters have already been reduced for FY04 No less than one station at the mouth of each watershed is suggested
Biological Monitoring [wadeable streams]	Continue enhancement of biological monitoring to include location of new reference stations, routine ambient stations, and inclusion of habitat assessment, as resources allow.	Each DEQ Regional Biologist currently monitors approximately 20-30 sites twice a year. The sites to be monitored should be prioritized in the following order (highest to lowest): a) Current reference sites, b) Sits involving immediate TMDL issues, c) Additional sites of special concern to the Regions and additional reference sites.
Lakes Monitoring	Implement lakes monitoring strategy to the extent allowed by budget.	a) Reduce the number of publicly accessible priority lakes monitored, per WQMIRA, to reflect the resources available in any given year. b) Retain for each priority lake selected for monitoring, per Guidance Memo No. 02-2004, a minimum sampling frequency of once monthly from April through October for one calendar year. c) Some "High Priority" lakes may warrant a sampling schedule above the minimum guidance requirement of seven runs (Apr.-Oct.) in one year out of the five. This is due to issues such as high recreational usage, shoreline development, or citizen concern. Such lakes may be monitored at a lesser frequency to be determined by the region once the minimum sampling frequency requirement of the lake guidance is met.

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Citizen Monitoring	Support for citizen monitoring provides the Commonwealth with supplemental data.	Most regional offices spend little time assisting citizen groups except for giving advice on monitoring sites and following up on problems detected by citizen monitoring efforts. Such efforts could be prioritized as follows: a) Immediate and acute situation detected would be treated as a pollution complaint under Group 1 monitoring priorities. b) If citizen monitoring results in a 305(b) listing as a "Water of Concern" (formerly called threatened) it would be prioritized per "Threatened Waters" under Group 2. c) If indications are that there might be a concern, monitoring staff should evaluate and determine if a field visit is warranted. Citizen nominations for additional monitoring by DEQ can also be ranked: a) Waters in an area of high recreational use b) Waters that can be incorporated into the current or upcoming watershed rotation c) Waters that are a "Water of Concern" d) Waters in an area of another environmental concern e) Other specific local factors

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Fish Tissue Monitoring	WQMIRA calls for an increase in the rate and amount of monitoring, contingent on the availability of adequate funding.	When fish-tissue-monitoring data indicate a potential area of concern due to elevated contamination levels and/or VDH requests such a study, special more intensive follow-up sampling will need to be performed. Special follow-up sampling of fish tissue by central office staff will need to be considered on a case-by-case basis as it is difficult to predict a level of follow-up monitoring that may be needed in any given year. Where appropriate, action plans should be submitted to the Agency Director for consideration for funding from VEERF in order to use available central office unit budget funds for continuation of the statewide fish tissue containment-monitoring program. Adequate routine fish tissue monitoring coverage on a statewide basis required approximately 300 sites to monitor all Virginia river basins during the last period of statewide monitoring. This involved sampling approximately 90-100 sites per year in order to accomplish this in slightly more than a three-year period (WQMIRA urged DEQ to convert to a three-year monitoring plan to cover the entire state if funding were available). a) Reverting back to a five-year statewide river basin monitoring rotation due to anticipated budgetary constraints and the recent reductions in central office staffing for this program would require approximately 60 site visits per year representing a 30-40% reduction in yearly effort. b) Recent wage staff reductions in the central office fish-tissue monitoring unit will require that staff from other central office OWQP units must be temporarily borrowed to assist in field collections in order for this reduced level of fish tissue monitoring to be accomplished in 2003. Even with this borrowed staff it may only be possible to monitor approximately 50 stations in calendar year 2003. This will be about a 50% reduction from the calendar year 2002 routine fish tissue contaminant-monitoring program.
Other Special Studies		Conduct as priorities dictate and resources permit.
Chesapeake Bay Biological Monitoring	Valuable as overall assessment of Bay health status and restoration targets.	Extent of monitoring is based on contractual funds dedicated to this effort.
Chesapeake Bay Ambient Toxicity Monitoring	Provides information called for under the CBP Toxics Strategy.	Scope of monitoring could be scaled back according to available funding; for a viable study, a minimum of 4 stations per stratum is required. The number of strata utilized is based on several variables (land use within study area, salinity, sediment type, etc.)

Group 2	Comments	Guidelines and Considerations for Reducing Monitoring Activity
Kepone	Information needed by VDH to assess the status of Kepone contamination within the existing general advisory area.	a) The Kepone monitoring effort was recently reduced from every year to once every two year. The analytical budget was also reduced by 50% so that only one half of the normal samples can be analyzed. This represents a 50% reduction in staff time and a 75% reduction in analytical funds over a two-year period. b) No monitoring is scheduled for 2003. The next monitoring would be in 2004. After the data for the fish collected in 2002 becomes available, DEQ will consult with the Virginia Department of Health to determine if monitoring efforts in 2004 and beyond can be further reduced. Monitoring on a less frequent basis such as every fifth year will be considered.
Sediment Monitoring (on its own)	Both the federal 106 program and the state WQMIRA specifically require sediment monitoring, so it is not feasible to eliminate the sediment monitoring.	Collecting one sediment sample at each fish-tissue-monitoring site under the reduced five-year routine fish-tissue monitoring program described under that monitoring heading would represent an approximate 50% reduction in yearly sediment monitoring analytical costs.
Threatened Waters (Waters of Concern)	Required by WQMIRA and increasingly expected by EPA as 303(d) follow-up.	The following factors are ranked from highest to lowest: a) Fish Tissue Threatened (skip an assessment cycle and return to such sites) b) Single-sampled moderately impaired benthic sites. c) Lower exceedences of numeric standards d) Nutrient enriched waters e) Citizen monitored areas needing follow up

Section III.

CEDS – Comprehensive Environmental Data System

Summary:

This section addresses uses of CEDS in the agency's water sampling programs. Included is all sampling for the ambient monitoring program, TMDLs, special studies, effluent sampling, and biomonitoring. CEDS provides a mechanism for documentation for regional annual monitoring plans, scheduling of all samples, special study details, and data review and retrieval.

Contact information for this Section:

For more information, please contact Charlie Morgan at 804-698-4473, or e-mail: chmorgan@deq.virginia.gov, or Roger Stewart at 804-698-4449, at e-mail: restewart@deq.virginia.gov.

CEDS and Water Samples

Background:

CEDS has been developed as an effective tool for scheduling sampling events, transmitting field data, documenting special studies, determination of status of samples, and retrieval of data. All DEQ staff who schedule, collect, and ship samples to DCLS, along with staff who develop annual monitoring plans, special studies and Quality Assurance Project Plans shall make appropriate use of CEDS.

Responsibilities:

Staff has specific responsibilities and deadlines for use of CEDS in agency monitoring and sampling programs. Those areas are outlined below.

1. Oversight Responsibility. It is the responsibility of supervisors of applicable DEQ staff to ensure the staff enter CEDS data in a timely and accurate manner and have an established QA/QC mechanism in place to be sure data are as accurate and timely as possible.
2. Data Entry. Staff developing sampling plans, scheduling samples, and conducting sampling are responsible for entering data in CEDS, with data quality and timeliness in accordance with the CEDS Water Monitoring and Procedures Manual.
3. Data Accuracy and Correction. Atypical values confirmed at the time of data entry should be noted in the comment field to clarify the status of that entry. Review for completeness and accuracy of monitoring data should be accomplished according to a plan and schedule developed by the agency QA officer.

CEDS Applications:

A number of CEDS applications exist for documenting monitoring plans, scheduling samples, entering field data, and reviewing analytical results. Unless otherwise indicated, references to the "CEDS Water Monitoring Procedural Manual" are referring to the manual found at (1,502kb file) (http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmceds.pdf).

1. Annual Monitoring Plan Submittal. Details for submitting the regional annual monitoring plan are outlined in the CEDS Water Monitoring Procedural Manual.
2. Special Study Submittal. Special Studies as defined for entry into CEDS as those studies for which more than one sampling event will be conducted. Special study SOPS should be stored in CEDS based on current training, CEDS release notes updates, and CEDS documentation. The assigned Special Study number should be used in the field data screen for samples collected in conjunction with the Special Study. Each special study must have a Quality Assurance Project Plan (QAPP) developed. This plan, along with pertinent details about sampling events must be entered in CEDS. Details can be found in the CEDS Water Monitoring Procedural Manual.
3. Submittal of Monthly Monitoring Schedules. Specific procedures and details for this activity can be found in the CEDS Water Monitoring Procedural Manual.
4. Scheduling of Individual Sampling Events not Included in the Monthly Monitoring Schedule. For samples (ambient, effluent, biomonitoring, and PReP) not included in the monthly monitoring schedule above, CEDS shall be used for scheduling. Procedures can be found in the CEDS Water Monitoring Procedural Manual.
5. Submittal of Field Data. Field data, including time of sample collection, shall be entered in CEDS on the same day as sample collection in order to have data available when sample reach DCLS. For sampling events where field monitoring occurs, but no samples are sent to the lab (biomonitoring, field DO surveys, etc.) stations are to be established in CEDS and field data are to be entered promptly. Details of this procedure, along with specific deadlines, are found in the CEDS Water Monitoring Procedural Manual.
6. EDAS Data into CEDS. EDAS will not be put into CEDS according to the existing CEDS priority list and/or until more programming staff can be hired.
7. Data review schedule and procedures. The *when* and *who* of a Data review schedule has been proposed for the upcoming monitoring program audit. Based on the outcome of the audit, procedures will be developed for reviewing data in CEDS.
8. Data Retrieval from CEDS. Laboratory results are available in CEDS once analyses are complete. Details on retrieval of data can be found in the CEDS Water Monitoring Procedural Manual.
9. Lab catalogs. This function may be used to view parameter group codes and the associated analytes as well as other useful information such as turn-around-time, reportable level, lab procedure and cost. Details on retrieval of this information can be found in the CEDS Water Monitoring Procedural Manual.
10. Station creation. Setup of stations shall be done in CEDS in accordance with procedures outlined in the CEDS Water Monitoring Procedural Manual.
11. Chain of Custody. CEDS may be used to create proper documentation that shall accompany chain of custody samples to DCLS.

Section IV.

Chain of Custody

Section 4.1 Guidance Memo No. 03-2003, Amendment #1 Interpretation for Water Monitoring of Guidance Memo No. 00-2016 Chain of Custody Policy and Procedures

Summary:

The attached memo, which was amended on March 14, 2006, clarified under which situations Chain of Custody procedures are not required when collecting water monitoring samples. (79kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cocinterp.pdf)

Section 4.2 Guidance Memo No. 00-2016, Amendment #1 Chain of Custody Policy and Procedures

Summary:

The attached memo established a policy and procedure on October 23, 2000, which was amended on March 14, 2006, for samples collected by DEQ staff from all media to follow in order to ensure the integrity of samples so they can be used as admissible evidence to enforce the Commonwealth's environmental laws and regulations. (376kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cocpol.pdf)

Section 4.3 Chain of Custody and Water Sample Collection Training

Summary:
This guidance requires DEQ water program staff that collect Chain of Custody samples to be trained and periodically tested, in water sample collection and applicable DEQ Chain of Custody procedures. The general guidance disclaimer does not apply to this training and testing guidance.

Contact information for this Section:
For more information about training, please contact Charlie Morgan at (804) 698-4473, or e-mail: chmorgan@deq.virginia.gov

Staff Training in Sample Collection and Chain of Custody Procedures
Agency Guidance Memos No. 00-2016, amendment # 1, Chain of Custody Policy and Procedures, dated March 1, 2006, and No. 03-2003, amendment # 1, Interpretation for Water Monitoring of Chain of Custody Policy and Procedures, dated March 1, 2006, details the procedures DEQ field staff are to follow when collecting samples. The Chain of Custody Policy is intended to "…ensure the integrity of samples so they can be used as admissible evidence to enforce the Commonwealth's environmental laws and regulations…" The potential importance a sample could have in a legal matter makes it essential that agency water program staff be properly trained in both sample collection and Chain of Custody procedures.

Accordingly, all water program staff who collect Chain of Custody samples, are required to be both trained and tested in sample collection and applicable Chain of Custody procedures. The agency training curriculum and guidelines will be established and conducted as follows:

1) By December 31, 2003, agency water program staff, working with the agency Training Manager, will develop an outline for the content of a training curriculum on the collection of Chain of Custody samples and applicable Chain of Custody procedures.

2) Agency water program staff, working with the agency Training Manager, will finalize and distribute to water program managers by September 15, 2004, a list of modules included in the class, and develop the necessary materials for this class no later than February 28, 2005. The training will be developed using modules for different water programs. Training may be obtained for either a single or multiple water programs. Applicable water programs will develop and/or update Standard Operating Procedures (SOPs) as needed to ensure training modules are current. Regional office and central office water program managers will provide a list of staff who require training, and the program modules each staff person needs, to the Training Manager by December 31, 2004.

3) Agency water program staff, working with the agency Training Manager, will conduct classes by December 31, 2006 and maintain them on the agency Learning Management System. Existing agency staffs in water programs that collect Chain of Custody samples are required to obtain training no later than December 31, 2006. Thereafter, applicable new hires will be required to successfully complete training before they collect any Chain of Custody samples for analysis by the agency and not later than 12 months after the date of hire. Successful completion of a re-test will be required for each applicable module every three years. The Office of Training Services will award a certificate to anyone who successfully completes a given module for the first time. The Office of Training Services will maintain a database of those who have taken the class, new hires needing training, and document all test scores. The Office of Training Services will also annually notify anyone needing to be tested or re-tested at least six months prior to their respective deadline.

4) After December 31, 2006 only staff in water programs who have successfully completed training will be authorized to collect Chain of Custody samples for any agency water program. Any staff person, who does not successfully complete training by December 31, 2006, must discontinue collecting Chain of Custody samples, for the applicable water program(s) until training is successfully completed.

Section V.

Quality Assurance

Summary:

This section addresses the requirement for a Quality Assurance Project Plan for all monitoring activities. It specifies the format, location of templates, where the finished documents should be stored and the specific responsibilities for submittal, approval, enforcement and updates.

Contact information for this Section:

For more information, please contact Gary Du, Water Quality Monitoring and Assessments, at (804) 698-4189, or e-mail: tdu@deq.virginia.gov

A Quality Assurance Project Plan (QAPP) will be developed for each monitoring activity including special studies. Additionally a Standard Operating Procedural manual (SOP) will be required for any methods of collection that differ from those specified in the Ambient Water Quality Monitoring SOP. QAPP documents will follow the format specified in the EPA QA/R-5 document available at http://www.epa.gov/quality/qa_docs.html. A template QAPP titled Special Study QAPP Template is available to DEQ personnel on DEQnet. The regional or divisional director (or their designee) and DEQ's Quality Assurance Coordinator must approve the QAPP and SOP documents prior to project implementation. All QAPP and SOP documents will be stored in the agency's database as well as any summary reports generated by the activity (see the Special Study QAPP Template on DEQnet for details). Excluding special study QAPP(s) and SOP(s), monitoring QAPP(s) and SOP(s) will also be stored on DEQnet.

DEQ personnel utilizing outside organizations to perform water quality monitoring or analyses will require those organizations to submit a QAPP and/or SOP(s) for approval prior to implementation of the program/project requiring those services. Annual updates of the QAPP and SOP should be grant deliverables in long-term projects.

Data review and training responsibilities will be addressed in all QAPP(s).

Data validation checks are generated by CEDS daily and the output is stored in the DISCOVERER WQM Parameter Error Check table. A member of the Quality Assurance Team at Central Office will review the reports on a quarterly basis and request laboratory data validations through the laboratory liaison within 30 days after conducting the review. The laboratory liaison will compile and forward the requests to DCLS within 7 days of receipt. A member of the Quality Assurance Team will also analyze the results of Quality Control samples collected in the field on a quarterly basis and provide the results within 45 days after the completion of the quarter to regional Monitoring Managers. Managers are responsible for distributing the information to regional personnel and initiating corrective action as recommended by the Quality Assurance Team member.

Quality Assurance and Quality Control procedures will be followed as specified in the appropriate programmatic SOP for each water quality monitoring activity.

It shall be the responsibility of the Quality Assurance Coordinator specified in the QAPP to ensure the QA activities for the project are properly followed and update the QAPP and SOP annually.

Special projects are assigned a unique identifier code when the QAPP and SOP entered into the special study screen of CEDS. All data entered into CEDS that are collected for a specific project will have the project's unique identifier code associated with it.

To ensure Water Quality Monitoring occurs in the most efficient and cost effective manner possible, Regional Water Monitoring Managers and/or the field supervisors who report directly to them shall:

1. randomly review vehicle mileage records for variances in mileage of routine monitoring runs;
2. randomly review monitoring runs to ensure the most efficient routes are planned; and,
3. routinely review field data sheets, instrument calibration logs, and quality control samples for inconsistencies.
4. review data for completeness no less than semi-annually.

In the event inconsistencies are believe to have occurred, managers should initiate corrective action as appropriate base on established Agency policies.

Section VI.

Flow Measurement Data Sources and Uses

Summary:

The demand for stream flow information has dramatically increased with the expansion of TMDL activities. The Office of Surface Water Investigations (SWI) in Charlottesville is responsible for stream flow data collection at gaging stations and TMDL stations across the state. The regions are responsible for communicating requests for gaging station flow data, 7Q10 and other probability estimates, stream cross-sections, and special flow monitoring stations to the SWI Manager in the Charlottesville office. Under the oversight of the Central Office (CO) Watershed Programs Group, the Regional TMDL Coordinators are responsible for determining flow probabilities and completing flow duration analyses related to TMDL development.

Contact information for this Section:

Contact the office of SWI at (434) 293-3031 if you have any questions regarding this section.

Background:

Flow measurements are necessary for determining water permit dilution limits, water supply withdrawal limits, flow duration analysis, and for TMDL studies and water quality assessments. Different meters and methods exist for measuring flow in streams. The methods used by DEQ were developed by the United States Geological Service (USGS): Rantz, S.W., and others, 1982, Measurement and computation of streamflow: volume 1. Measurement of Stage and Discharge, U.S. Geological Survey Water-Supply Paper 2175.

Responsibilities:

Channels exist for the communication of information regarding flow measurement. Water Permit writers, Water Assessors, and TMDL coordinators in the Regions and in Central Office must prioritize their needs in terms of flow measurement and analysis. Specific requests for flow data must be relayed to SWI so sampling may begin promptly (as resources permit).

4. Station Siting. Water Permit writers, Water Assessors, and Regional TMDL Coordinators will determine which stations require flow data. They must prioritize their requests and communicate that information to the SWI Manager.
5. Data Collection. SWI is responsible for collecting flow data at 67 gaging stations and at TMDL sites. Regional staff can collect flows for non-TMDL special studies. All data will be collected according to USGS methods.
6. Data Storage. Current and historical mean daily discharge data is available on the USGS website: http://www.usgs.gov. Periodically, USGS publishes a record of all streamflow sampling locations, data sources, and data types organized by river basin (Compilation of Surface-Water and Water Quality Data-Collection Sites on Selected Streams in Virginia. U.S. Geological Survey Open-File

Report 93-462, 1993). SWI maintains an internal database (found on DEQ's network S: drive) of flow frequencies for discontinued and active gaging stations. **Directions on how to view data on the S: drive are described below:**

- Map to the S: Drive by clicking on **Network Neighborhood**.
- Click on *Tools* then select **Map Network Drive**.
- Select **Microsoft Windows Network**.
- In the Drive Box, use the drop-down selection for the **S: Drive**.
- In the Path Box type: **\\cntrlfs01\flowfreq$**
- Click *OK*. (The connection may or may not be saved after you turn your machine off. If not saved re-establish the connection as in steps 1 -6.)
- Close **Network Neighborhood**.
- Click the *START* Button on the Task Bar.
- Select **Programs** then **Windows NT.** The S: Drive should be available to you in the NT Window.

List of directories and contents:
Note: Readme.docs within the various directories provide information on the contents of the directory.

- The **ANALYSIS** directory contains passed VPDES flow memos developed for VPDES Permits in Ffm2001 and Ffm2002. The Regression Analysis subdirectory contains the spreadsheets used in developing the flow statistics for the permitted site.
- The **Archive** directory contains Flow memos developed by year from 1993 through 1997.
- The **Gaging Station Statistics** directory contains statistics for each station as well as maintenance agency etc.
- The **Misc. Measurements** directory contains the location and instantaneous flow measurements conduct by SWI in support of the VPDES Permitting Program and TMDL Program.
- The **Tracking** directory contains the Flowtrac Access Database of flows developed for the VPDES Permitting Program.

7. Data Analysis. SWI is responsible for calculating discharge and flow probability for the gaging stations. The methods used for computation of the latter are derived from USGS methods outlined in Rantz, S.E., and others, 1982, Measurement and computation of streamflow: volume 2. Computation of discharge, U.S. Geological Survey Water-Supply Paper 2175. RO TMDL personnel are responsible for developing flow duration analysis and flow probabilities as needed for TMDL development. RO Permit Staff completes statistical analysis related to permitting. CO and RO Assessment staffs utilize streamflow data when performing Water Quality Assessments.
8. Data QA/QC. Daily equipment calibration and regular checks on meters shall be performed according to USGS methods. As resources permit, SWI shall assist regional offices with QA/QC.
9. Data Communication. It is the responsibility of Water Permit writers, Water Assessors, and TMDL personnel to communicate flow data to the appropriate contractors and the public as needed.

Section VII.

Citizen/Non-Agency Monitoring Guidance for DEQ Staff

Summary:

This memo provides guidance for responding to citizen requests for agency monitoring in accordance with the 1997 *Water Quality Monitoring, Information and Restoration Act*, agency support for citizen/non-agency monitoring according to the Code of Virginia §62.1-44.19:11, and conducting follow-up monitoring of waters with observed effects as identified in the 305(b) water quality assessment.

Contact information for this Section:

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Guidance on Citizen/Non-Agency Monitoring

For the purposes of this guidance document, a citizen water quality monitoring program, or citizen monitoring, is defined as water quality monitoring which uses volunteers to collect the data. Local governments, soil and water conservation districts, citizen organizations, community organizations, or colleges run some of these programs. Generally, K-12 school monitoring is conducted for educational purposes and does not fall under "citizen monitoring" unless working in cooperation with existing citizen monitoring efforts. "Citizen monitoring" is not defined as monitoring conducted by all entities external to DEQ, such as colleges and local governments, unless volunteers are used in their efforts. Non-DEQ government agencies, colleges, and other organizations that do not use citizen volunteers are defined by DEQ as "non-agency" groups. Organizations that are contracted directly by DEQ are considered DEQ data and approved for use through other procedures.

7.1 Citizen Nominations for Water Quality Monitoring

The 1997 *Water Quality Monitoring, Information and Restoration Act* (WQMIRA) directs the Board to provide a procedure for citizens to nominate portions of lakes, streams, and rivers of Virginia for water quality monitoring by DEQ (§62.1-44.19:5.F). This procedure was updated in 2007 to instruct the Water Quality Data Liaison (Data Liaison) to distribute the nomination guidance and nomination form to interested parties by January 1st of each calendar year. Each request must be submitted to the Data Liaison between January 1st and April 30th of each calendar year using the nomination form. See the most current version of the nomination guidance for detailed procedures for citizens to follow when requesting monitoring pursuant to WQMIRA. (103kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cmonnom.pdf)

The Data Liaison will provide the nominations to the monitoring managers of the appropriate regional and central offices by May 15th of each calendar year, requesting a written response from the monitoring managers by August 1st. The regional office or central office unit should approve or deny each request using the most current version of the review form. Upon consideration of the requests, staff is asked to complete a checklist on the review form so that the elements considered by each region or central office unit is consistent. Overall, the checklist guides staff to consider whether nominated stream segments are: in an area of high recreational use, can be incorporated into the current or upcoming watershed rotation, scheduled for future monitoring, a "Water of Concern", in an area of another environmental concern, or a priority according to the monitoring strategy. (159kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/cmonrev.pdf)

The Data Liaison will respond in writing to each request by August 31st of each calendar year in accordance with the statute. Each response will indicate DEQ's approval or denial of the request and state the reasons for denial.

7.2 DEQ Support for Citizen/Non-Agency Monitoring

Technical guidance is provided to citizen monitoring organizations according to the Code of Virginia §62.1-44.19:11 through the Water Quality Data Liaison (Data Liaison) and occasionally assistance specific to a region is requested from regional office staff by a citizen or non-agency monitoring organization or the Data Liaison. This technical assistance is mainly related to selecting sites that will not duplicate DEQ monitoring efforts, choosing appropriate protocols and parameters (especially those that will produce data that can be used by DEQ for water quality assessments), and developing a Quality Assurance Project Plan. The most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual* is a primary source of technical assistance for citizen monitoring organizations. The manual discusses in detail the development of a monitoring program and Quality Assurance Project Plans (QAPPs), along with discussing the various parameters commonly monitored by volunteer monitoring programs in Virginia.

Chemical and benthic macroinvertebrate citizen/non-agency monitoring QAPPs are reviewed and approved in accordance with current agency guidelines and Section 7.3 below. The citizen/non-agency monitoring organization should submit plans to the Data Liaison in accordance with the format provided in the *EPA Volunteer Monitor's Guide to Quality Assurance Project Plans.* The Data Liaison provides assistance to organizations in the development of QAPPs.

In addition to technical assistance, the Citizen Water Quality Monitoring Grant Program provides competitive grants, as state resources allow, for support of citizen monitoring programs. This grant program is referenced in the most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual.* The Request for Proposals for the grant program contains the specific grant requirements.

The Code of Virginia §62.1-44.19:11 states that grant funds may be provided to organizations that are conducting water quality monitoring under a Memorandum of Agreement (MOA) with DEQ. Currently, the grant contracts signed by DEQ and the grantees meet the requirements of §62.1-44.19:11. A boilerplate MOA (see the most recent version of the *Virginia Citizen Water Quality Monitoring Program Methods Manual)* has been developed for citizen monitoring organizations desiring a more comprehensive MOA with DEQ.

7.3 Submittal of Data to Assessment Staff

The Water Quality Data Liaison (Data Liaison) will solicit data from citizen and non-agency monitoring organizations. The Data Liaison, along with DEQ's Quality Assurance Officer and Biological Monitoring Coordinator, will review all QAPPs, including standard operating procedures (SOPs), training manuals, and current monitoring procedures for each of the active monitoring groups. Based upon the review of all procedures, the appropriate use of the data for each parameter will be determined. Since there are varying levels of data use, DEQ approval is in the form of a letter that approves data for each parameter for use in the 305(b) water quality assessment and/or 303(d) Impaired Waters List, and specifies the appropriate data use for each parameter.

All QA/QC documentation and citizen/non-agency monitoring data collected during an assessment window must be provided to the Data Liaison by February 28th following the last year of that assessment window. The Data Liaison will submit by April 1st (or according to the assessment schedule) each organization's data set to the appropriate regional office assessment staff along with a summary table and cover memo detailing QA/QC approval. If regional office staff receives citizen/non-agency data from an individual group, the regional office should forward that data for review as outlined above. Data will be used by DEQ as outlined in the assessment guidance.

Please refer to the most recent §305(b) Water Quality Assessment Guidance document for detailed information concerning how to process citizen/non-agency data and coordinate the final assessment with the Data Liaison. The §305(b) Water Quality Assessment Guidance document is submitted to the public for review via the *Virginia Register* in either the late spring or summer prior to each report being due in April of even-numbered years.

7.3.1 DEQ Quality Assurance/Quality Control Approvals of Citizen/Non-Agency Data

Citizen/non-agency data received by DEQ falls into one of three levels based on the Quality Assurance and Quality Control (QA/QC) practices used by the data submitter. The level of data determines how it is used by DEQ.

Level III citizen/non-agency data may be used to assess for designated uses – 305(b) assessment; and in 303(d) listing and delisting of impairments. Only Level III data may be used to indicate either Fully Supporting or Impaired status. DEQ requires the strictest QA/QC standards for Level III quality data.

Level II citizen/non-agency data will be accepted by DEQ to provide baseline information and as a screening tool to indicate "Waters with observed effects" (Category 3C). Waters with observed effects are not necessarily predicted to exceed water quality standards or be listed as impaired in the next reporting period. Rather, they are highlighted as potential problem areas. These waters would be prioritized for additional follow-up monitoring by DEQ, but such data will not be used independently for 303(d) listing or delisting purposes. As resources allow, additional monitoring may be done by DEQ on those streams that had the highest potential for water quality problems as identified by the citizen/non-agency data.

Level I citizen/non-agency data will be accepted by DEQ for the purpose of community education and awareness, watershed characterization and red flag or early warning. This type of information may be considered as general background information, but is not of sufficient rigor for listing decisions.

7.4 DEQ Response to Problems Detected by Citizen/Non-Agency Monitoring Organizations

Since citizen monitoring organizations generally monitor on a regular basis, a volunteer monitor may detect acute pollution incidents, degradation, or potential problems. Often, the citizen/non-agency monitoring organization may not know which agency is responsible or what is causing the problem but believes that their observations warrant further investigation. The organization or individual monitor may report the problem to the Water Quality Data Liaison (Data Liaison) or directly to the regional DEQ office.

These reports should be handled as follows:

1. If the problem is not under the purview of DEQ (for example, erosion and sediment control issues should be referred to local government staff), the organization should be directed to the appropriate agency.

2. If the problem is immediate and acute, it should be immediately referred to the Pollution Response Program (PREP). Examples of acute problems include a fish kill, oil spill, or red tide.

3. If the problem is under DEQ's purview and not acute in nature (such as large sudden fluctuations in monitoring data results), the regional office shall determine the most appropriate way to respond to this and notify the complainant and the Data Liaison within 30 days whether action will be taken. The regional office shall notify the complainant and the Data Liaison the results of any action taken within 30 days of completion of such action(s).

The regional office should document complaints and responses. Any complaints received by the Data Liaison will immediately be forwarded as outlined above, or forwarded to the appropriate regional office's monitoring supervisor for follow-up.

7.4.1 DEQ Follow-Up Monitoring of Waters with Observed Effects

In accordance with the agency 305(b) water quality assessment guidance and Section 7.3 above, Level III data collected under DEQ-approved Quality Assurance Project Plans (this approval is parameter-specific for a specific level of data use) will be included in the 305(b) assessment and 303(d) listing or delisting. Level II non-agency water column chemical data and biological monitoring data collected by citizen/non-agency monitoring organizations and incorporated into the assessment process may result in a stream segment being identified as a water with observed effects.

The agency will use both chemical and biological citizen/non-agency monitoring data to prioritize stream segments for follow-up monitoring. It is the intention of the agency, as resources allow, to conduct follow-up monitoring in stream segments identified as waters with observed effects, with high priority stream segments being addressed first, followed by lower priority stream segments that do not meet the criteria specified below.

Follow-up monitoring should be conducted on high priority stream segments within three years of the final submittal date of the 305(b) water quality assessment that identifies a stream segment as a water with observed effects. Regional assessment staff will be responsible for coordinating with regional monitoring staff to identify those waters with observed effects that are considered high priority for follow-up monitoring. Regional offices will schedule follow-up monitoring as confirmatory visits or part of the annual monitoring plan development and notify the Data Liaison. The Data Liaison will notify the organization of the plan for DEQ follow-up monitoring so that monitoring efforts will not be

duplicated. Regional offices may use additional discretion in prioritizing the high priority stream segments for follow-up monitoring based on available resources and knowledge of the stream segment(s) in question. This may include consultation with the citizen monitoring group(s) that conducted the monitoring identifying the waters with observed effects.

High priority stream segments resulting from citizen water column chemical data are defined by the exceedance rate of a given parameter and a minimum sample size. The following criteria shall be used to identify high priority stream segments:

1. There must be a minimum number of four samples for the parameter(s) of concern.
2. The sampling events must extend over at least a three-month period but must have occurred within the most recent two years of the 305(b) assessment window. The sampling events are not required to be evenly distributed over the three-month period, but should reflect stream conditions over the three-month term.
3. The exceedance rate of the water quality criteria and/or screening value must be greater than 25% during the 305(b) assessment period.

High priority stream segments resulting from citizen biological surveys are defined by the observed effect on the benthic community and a minimum sample size. The following criteria shall be used to identify high priority stream segments:

1. There must be a minimum of four sampling events conducted over at least a one-year period during the 305(b) assessment window. These events must have occurred within the most recent two years of the 305(b) assessment window.
2. The monitoring data must capture seasonal variation and shall include at least one spring and one fall sampling event during the 305(b) assessment period.
3. More than 25% of the samples received during the 305(b) assessment period show a high probability of adverse conditions for benthic macroinvertebrates with a greater emphasis placed on the most recent samples.

At a minimum, DEQ will conduct follow-up monitoring for the same parameter(s) that resulted in the stream segment being identified as a water of concern by the citizen data. Staff may elect to monitor for an expanded set of parameters based upon concerns raised by the citizen data, knowledge of the stream segment, or other factors that relate to any threatened designated use.

Section 7.5 Guidance Memo No. 06-2010 Guidelines for DEQ Review and Approval of Biological Monitoring QAPPs Submitted by Non-DEQ Sources

Summary:

This document, dated August 28, 2006, provides DEQ guidelines for review and approval of biological monitoring Quality Assurance Project Plans (QAPPs) submitted by non-DEQ entities. (364kb file)

(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/biomonqapp.pdf)

Section VIII.

Standard Operating Procedures Manual for The Department of Environmental Quality Water Monitoring Programs

Summary:

The Standard Operating Procedures (SOP) Manual describes the routine operations and quality control activities performed by the Department of Environmental Quality (DEQ) in its ongoing data generating programs. Outlining procedures for sampling and field testing activities helps ensure that these procedures are standardized geographically across the state and between monitoring programs. The procedures described in this manual also help ensure that sampling precision, accuracy, representativeness, comparability and completeness of the data are obtained and documented. The sample collection procedures described in this document must be followed for all Water Quality Monitoring Programs unless the program is specifically covered under another SOP and/or Quality Assurance Project Plan (QAPP) that has been approved by the agency's Quality Assurance (QA) Officer. (2,730kb file)

Contact Information for this Section:

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(http://www.deq.virginia.gov/watermonitoring/pdf/guidancemanual/wqmsop.pdf)